<u>REMARKS</u>

This application has been carefully reviewed in light of the Office Action dated February 21, 2007. Claims 1 to 5 and 7 to 85 are pending in the application, of which Claims 1, 11, 13, 22, 24, 38, 53 to 55 and 68 to 70 are independent. Reconsideration and further examination are respectfully requested.

Claims 1 to 7, 9 to 12, 53 to 58, 62 to 73 and 77 to 85 were rejected under 35 U.S.C. § 102(e) over U.S. Published Appln. No. 2003/0113027 (Chan). Claims 13 to 16, 18 to 20, 22 and 23 were rejected under 35 U.S.C. § 102(e) over U.S. Published Appln. No. 2003/0123744 (Chui). Claims 24 to 52 were rejected under 35 U.S.C. § 102(b) over "An overview of the JPEG 2000 still image compression standard" (Rabbani and Joshi). Claim 8 was rejected under 35 U.S.C. § 103(a) over Chan. Claim 17 was rejected under 35 U.S.C. § 103(a) over Chui in view of U.S. Patent No. 6,360,019 (Chaddha). Claim 21 was rejected under 35 U.S.C. § 103(a) over Chui. Claims 59 to 61 and 74 to 76 were rejected under 35 U.S.C. § 103(a) over Chan in view of Rabbani and Joshi. Reconsideration and withdrawal of this rejection are respectfully requested.

The present invention concerns reducing alias in an image, the alias occurring as a result of hierarchical encoding. It is advantageous to use hierarchical encoding since an image of desired size can be obtained by decoding encoded data only up to a layer of hierarchy needed to achieve the desired size without decoding all layers of hierarchy. However, hierarchical encoding has a drawback of causing aliasing of the image which degrades image quality.

The present invention as recited in independent Claims 1, 11, 13 and 22 is characterized by decoding (Claims 1 and 11) or encoding (Claims 13 and 22) the image up

to a layer of hierarchy which is one layer more than a minimum number of layer(s) of hierarchy necessary to acquire an image of the determined size. After decoding the image, the size of the image is reduced. In this manner, it is possible to reduce the aliasing while maintaining the efficiency of hierarchical encoding.

Furthermore, according to the present invention as recited in independent Claims 24 and 38, during the encoding process, a frequency component which causes aliasing of an image signal of the image is restrained in advance of separating the image signal into layers of hierarchy using a hierarchy separation filter.

Moreover, according to the present invention as recited in Claims 53 to 55 and 68 to 70, during the decoding process, a frequency component, which corresponds to an alias caused by separating the image data into layers of hierarchy upon encoding, of the decoded image data is restrained.

Turning to specific claim language, amended independent Claim 1 is directed to a decoding method of decoding encoded image data which has been hierarchically encoded in advance. The method includes determining a size of an image to be outputted; decoding the encoded image data up to a layer of hierarchy which is one layer more than a minimum number of layer/layers of hierarchy necessary to acquire an image of the determined size; and reducing the size of the decoded image to the determined size.

In contrast, Chan discloses decoding a coded representation of an original image, wherein an output resolution of the original image is determined, a number of sub-passes to extract is determined based on the resolution, the determined sub-passes are extracted, and the remaining sub-passes that are not relevant to the desired output

- 22 -

resolution are discarded. However, Chan is silent on decoding image data up to a layer of hierarchy one layer more than a layer of hierarchy needed to acquire an image of the determined resolution. Therefore, Chan is not seen to disclose or suggest decoding the encoded image data up to a layer of hierarchy which is one layer more than a minimum number of layer/layers of hierarchy necessary to acquire an image of the determined size and reducing the size of the decoded image to the determined size, as featured in Claim 1.

Accordingly, Applicant submits that Claim 1 is in condition for allowance and respectfully requests same.

Claim 11 is directed to an apparatus substantially in accordance with the method of Claim 1. Accordingly, Applicant submits that Claim 11 is also in condition for allowance and respectfully requests same.

Amended independent Claim 53 is directed to a decoding method of decoding encoded image data which has been hierarchically encoded in advance. The method includes determining a layer of hierarchy up to which the encoded image data is to be decoded; decoding the encoded image data up to the determined layer; judging whether or not the determined layer corresponds to the highest layer of hierarchy of the encoded image data; and restraining, when the determined layer does not correspond to the highest layer, a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy alias, of the decoded image data.

While Chan discloses a lowpass filter and a high pass filter providing normalization such that a sub-band has the same average value as the original image, Chan is silent on restraining a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy alias, of the decoded image data.

Therefore, Chan is not seen to disclose or suggest restraining a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy alias, of the decoded image data, as featured in Claim 53.

Accordingly, Applicant submits that Claim 54 is in condition for allowance and respectfully requests same.

Claims 54 and 55 are methods featuring restraining a frequency component, which corresponds to alias occurred by separating the image data into layers of hierarchy alias, of decoded image data, as featured in Claim 53. Accordingly, Applicant submits that Claims 54 and 55 are also in condition for allowance and respectfully requests same.

Claims 68, 69, and 70 are directed to apparatuses substantially in accordance with the methods of Claims 53, 54, and 55, respectively. Accordingly, Applicant submits that Claims 68, 69, and 70 are also in condition for allowance and respectfully requests same.

Amended independent Claim 13 is directed to an encoding method of hierarchically encoding an image. The method includes determining a size of an image to be outputted; and encoding the image up to a layer of hierarchy which is one layer more than a minimum number of layer/layers of hierarchy necessary to acquire an image of the determined size.

Chui discloses a process for generating an image file that includes determining a number of rows and columns of tiles needed to cover an image, processing the tiles by applying a wavelet-like decomposition transform, and encoding the result using a sparse data compression and encoding procedure. To decode the data for a tile, sub-bands of the tile are decoded, except for sub-bands not needed for the specified resolution

level. While Chui discloses a sparse data compression and encoding procedure, Chui is silent on encoding more data than what is needed to decode the image file at a specified resolution. Therefore, Chui is not seen to disclose or suggest encoding an image up to a layer of hierarchy which is one layer more than a minimum number of layer/layers of hierarchy necessary to acquire an image of the determined size, as featured in Claim 13.

Accordingly, Applicant submits that Claim 13 is in condition for allowance and respectfully requests same.

Claim 22 is an apparatus claim substantially in accordance with the method of Claim 13. Accordingly, Applicant submits that Claim 22 is also in condition for allowance and respectfully requests same.

Amended independent Claim 24 is directed to an encoding method of hierarchically encoding an image. The method includes restraining a frequency component which causes alias of an image signal of the image in advance of separating the image signal into layers of hierarchy; and separating the restrained image signal into layers of hierarchy using a hierarchy separation filter.

Rabbani and Joshi discloses the JPEG 2000 still image compression standard. While Rabbani and Joshi disclose a pair of low-pass and high-pass filters in an analysis filter bank (page 8, Fig. 2). Rabbani and Joshi is silent on restraining frequency components which cause alias in advance of separating image signals into layers of hierarchy using the hierarchy separation filter. Therefore, Rabbani and Joshi is not seen to disclose or suggest restraining a frequency component which causes alias of an image signal of the image in advance of separating the image signal into layers of hierarchy, and

separating the restrained image signal into layers of hierarchy using a hierarchy separation filter, as featured in Claim 24.

Accordingly, Applicant submits that Claim 24 is in condition for allowance and respectfully requests same.

Claim 38 is an apparatus claim substantially in accordance with the method of Claim 24. Accordingly, Applicant submits that Claim 38 is also in condition for allowance and respectfully requests same.

The other pending claims in this application are each dependent from the independent claims discussed above and are therefore believed allowable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

CONCLUSION

No claim fees are believed due; however, should it be determined that additional claim fees are required, the Director is hereby authorized to charge such fees to Deposit Account 50-3939.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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